Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

1. (Currently Amended) A diagnostic method for a fuel cell comprising a plurality of cells, comprising:

supplying an anode of the fuel cell with hydrogen or a hydrogen-containing gas;

supplying a cathode with an inert gas or vacuuming the cathode;

detecting an amount of the inert gas supplied to the cathode;

measuring a gas pressure at the anode;

measuring a gas pressure at the cathode;

measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell and the inert gas is supplied to the cathode or the cathode is vacuumed, wherein an operation state of the fuel cell is changed when measuring the voltage of a cell;

introducing a cooling medium into a passage within the fuel cell;

changing a temperature of the cooling medium when measuring the voltage of each cell; and

determining an amount of cross-leak based on the measured gas pressure at the anode, the measured gas pressure at the cathode, and on a measured voltage of each cell[[.]],

wherein in the determining step, an amount of hydrogen cross-leak of each cell is determined from the measured voltage of each cell generated based on a principle of a hydrogen concentration cell, and

wherein the amount of cross-leak is calculated based on the pressure of the hydrogen-containing gas at the cathode, on the total pressure of the inert gas supplied to the cathode, and on the amount of the inert gas supplied to the cathode.

2-3. (Canceled).

4. (Original) The diagnostic method according to claim 1, wherein the voltage of each cell is measured in a state where the plurality of cells are stacked.

5. (Original) The diagnostic method according to claim 1, further comprising changing at least one of the gas pressure at the anode and the gas pressure at the cathode when measuring the voltage of each cell.

6. (Canceled).

7. (Original) The diagnostic method according to claim 1, wherein the inert gas supplied to the cathode is nitrogen.

8. (Previously Presented) A diagnostic method for a fuel cell battery comprising a plurality of cells, comprising:

supplying an anode of the fuel cell battery with hydrogen or a hydrogen-containing gas;

measuring a gas pressure at the anode;

measuring a gas pressure at the cathode;

measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell and the cathode is vacuumed;

introducing a cooling medium into a passage within the fuel cell;

changing a temperature of the cooling medium when measuring the voltage of each cell; and

determining an amount of cross-leak based on the measured gas pressure at the anode, the measured gas pressure at the cathode, and on a measured voltage of each cell.

9. (Previously Presented) The diagnostic method according to claim 8, wherein in the determining step, an amount of hydrogen cross-leak of each cell is determined from the measured voltage of each cell generated based on a principle of a hydrogen concentration cell.

10. (Previously Presented) The diagnostic method according to claim 8, wherein the voltage of each cell is measured in a state where the plurality of cells are stacked.

11. (Previously Presented) The diagnostic method according to claim 8, further comprising changing at least one of the gas pressure at the anode and the gas pressure at the cathode when measuring the voltage of each cell.

12. (Canceled).

13. (Previously Presented) The diagnostic method of claim 1, wherein the changing a temperature of the cooling medium changes the temperature of the fuel cell from a first temperature in the range of normal operation to a second temperature within the range of normal operation.

14. (Previously Presented) The diagnostic method of claim 8, wherein the changing a temperature of the cooling medium changes the temperature of the fuel cell from a first temperature in the range of normal operation to a second temperature within the range of normal operation.

15. (New) The diagnostic method according to claim 1, wherein the pressure of the hydrogen-containing gas at the cathode is calculated using the equation,

$E=2.3026 \times \{(RT)/(2F)\} \times \log_{10}\{P_{H2}(a)/ P_{H2}(c)\}$, wherein

E: electromotive force of a cell (potential difference detected by cell voltage monitors 40)

R: gas constant=8.31 (J/mol · K)

F: Faraday constant

T: temperature (° K)

$P_{H2}(a)$: anode-side, or anode hydrogen pressure (KPa abs).

16. (New) The diagnostic method according to claim 1, wherein the total pressure of the inert gas supplied to the cathode is a value measured by a manometer located in supply piping for the inert gas.

17. (New) The diagnostic method according to claim 1, wherein the amount of the inert gas supplied to the cathode is calculated at least in part on a value measured by a mass flow controller located in supply piping for the inert gas.

18. (New) The diagnostic method according to claim 8, further comprising:

detecting an amount of the inert gas supplied to the cathode; and

calculating an amount of cross-leak based on the pressure of the hydrogen-containing gas at the cathode, on the total pressure of the inert gas supplied to the cathode, and on the amount of the inert gas supplied to the cathode,

wherein the pressure of the hydrogen-containing gas at the cathode is calculated using the equation,

$E=2.3026 \times \{(RT)/(2F)\} \times \log_{10}\{P_{H2}(a)/ P_{H2}(c)\}$, wherein

E: electromotive force of a cell (potential difference detected by cell voltage monitors 40)

R: gas constant=8.31 (J/mol · K)

F: Faraday constant

T: temperature (° K)

$P_{H2}(a)$: anode-side, or anode hydrogen pressure (KPa abs),

wherein the total pressure of the inert gas supplied to the cathode is a value measured by a manometer located in supply piping for the inert gas, and

wherein the amount of the inert gas supplied to the cathode is calculated at least in part on a value measured by a mass flow controller located in supply piping for the inert gas.

19. (New) A diagnostic method for a fuel cell comprising a plurality of cells, comprising:

supplying, via hydrogen gas supply piping, an anode of the fuel cell with hydrogen or a hydrogen-containing gas;

supplying, via inert gas supply piping, a cathode with an inert gas or vacuuming the cathode;

supplying, via cooling piping, a cooling medium into a passage within the fuel cell;

measuring a pressure of the hydrogen gas in the hydrogen supply piping with a manometer;

measuring a pressure of the inert gas in the inert gas supply piping with a manometer and a amount of the inert gas with a mass flow controller;

measuring a temperature of the cooling medium in the cooling medium piping;

measuring a gas pressure at the anode;

measuring a gas pressure at the cathode;

measuring a voltage of each cell under a condition in which the hydrogen or the hydrogen-containing gas is supplied to the anode of the fuel cell and the inert gas is supplied to the cathode or the cathode is vacuumed;

changing a temperature of the cooling medium, or at least one of the gas pressure at the anode or cathode when measuring the voltage of each cell, in order to change an operational state of the fuel cell when measuring the voltage of a cell; and

determining the amount of cross-leak of each cell by calculating the following equation,

$P_{H2}(c)=\{(\text{cross-leak amount})/(\text{cathode-side gas amount})\} \times P_{TOTAL}(c)$, wherein

(i) $P_{H2}(c)$ is calculated by using the equation,

$E=2.3026 \times \{(RT)/(2F)\} \times \log_{10}\{P_{H2}(a)/ P_{H2}(c)\}$, wherein

E: electromotive force of a cell (potential difference detected by cell voltage monitors 40)

R: gas constant=8.31 (J/mol · K)

F: Faraday constant

T: temperature (° K)

$P_{H2}(a)$: anode-side, or anode hydrogen pressure (KPa abs);

(ii) $P_{TOTAL}(c)$ is a value measured by the manometer located in the inert gas supply piping; and

(iii) the cathode-side gas amount is calculated, at least in part, on the value measured by the mass flow controller.